

What is claimed is:

1. A medical device system that provides treatment therapy for a nervous system disorder, comprising:

a first electrode;

a selected electrode;

a stimulation unit that applies a stimulation signal to the first electrode for supporting the treatment therapy during an occurrence of a detection cluster, the detection cluster being indicative of a seizure of the nervous system disorder, the stimulation signal having at least one stimulation pulse;

a detection unit that receives a first signal through a first input port from the first electrode to and a selected signal through a selected input port from the selected electrode, the detection module comprising:

a processing module that analyzes the first signal and the selected signal to determine the occurrence of the detection cluster and instructs the stimulation module to generate the stimulation signal on the first electrode;

a first blanking module that disconnects the first electrode from the first input port of the detection module when the stimulation module is applying the stimulation signal to the first electrode; and

a second blanking module that notifies the processing module whether to process the first signal and whether to process the selected signal.

2. The medical device system of claim 1, wherein the detection unit further comprises:

a first amplifier that connects to the first input port and that amplifies the first signal; and

a selected amplifier that connects to the selected input port and that amplifies the selected signal, wherein the second blanking module notifies the processing module not to process the first signal for a first time duration.

3. The medical device system of claim 2, wherein the second blanking module notifies the processing module not to process the selected signal for a second time duration.

4. The medical device system of claim 3, wherein the first time duration and the second time duration are approximately equal.

5. The medical device system of claim 3, wherein the detection unit further comprises:

a timing module that is connected to the processing module and that generates a first stimulation indicator to the processing module that signifies when to generate a first stimulation pulse.

6. The medical device system of claim 5, wherein the timing module generates a first blanking indicator to the first blanking module that signifies when to disconnect the first electrode from the first input port.

7. The medical device system of claim 5, wherein the first blanking module disconnects the selected electrode from the selected input port of the detection unit, and wherein the timing module generates a first blanking indicator to the first blanking module that signifies when to disconnect the selected electrode from the selected input port.

8. The medical device system of claim 5, wherein the timing module generates a second blanking indicator to the second blanking module that signifies when the processing module shall not to process the first signal.

9. The medical device system of claim 5, wherein the timing module generates a second blanking indicator to the second blanking module that signifies when the processing module shall not to process the selected signal.

10. The medical device system of claim of claim 5, wherein the timing module generates a second stimulation indicator to the processing module that signifies when to generate a second stimulation pulse, the second stimulation pulse being subsequent to the first stimulation pulse.

11. The medical device of claim 1, further comprising:
 - a data storage unit that stores data representing the first signal and the selected signal during the detection cluster.
12. A method for providing treatment therapy for a nervous system disorder, comprising:
 - (a) receiving a first signal from a first electrode and a selected signal from a selected electrode;
 - (b) analyzing the first signal and the selected signal;
 - (c) in response to (b), delivering the treatment therapy;
 - (d) blanking the first signal when delivering the treatment therapy; and
 - (e) blanking the first signal during a first blanking time interval and the selected signal during a second blanking time interval.
13. The method of claim 12, wherein (c) comprises generating a stimulation pulse through the first electrode during a stimulation time interval, wherein (d) comprises blanking the first signal when generating the stimulation pulse through the first electrode, and wherein the first blanking time interval and the stimulation time interval overlap.
14. The method of claim 13, wherein (d) comprises:
 - (1) disconnecting the first electrode from a first amplifier that amplifies the first signal.
15. The method of claim 14, wherein (d) further comprises:
 - (2) connecting the first amplifier to a constant voltage source.
16. The method of claim 13, wherein (e) comprises:
 - (1) not processing the first signal during the first blanking time interval.
17. The method of claim 13, wherein the first blanking time interval and the second blanking time interval are essentially equal.

18. The method of claim 13, wherein (e) comprises:
 - (i) determining the second blanking time interval, wherein an artifact is induced by the first stimulation pulse; and
 - (ii) blanking the selected signal during the second blanking time interval.
19. The method of claim 13, wherein (e) comprises:
 - (1) disconnecting the selected electrode from a selected amplifier that amplifies the selected signal.
20. The method of claim 19, wherein (e) further comprises:
 - (2) connecting the selected amplifier to a constant voltage source.
21. The method of claim 13, wherein (e) comprises:
 - (1) not processing the selected signal during the second blanking time interval.
22. The method of claim 21, wherein a corresponding output ratio is processed as
being essentially constant during the second blanking time interval.
23. The method of claim 18, wherein (i) comprises:
 - (1) calculating the artifact from a geometric configuration of a set of electrodes, the set comprising the first electrode and the second electrode.
24. The method of claim 18, wherein (i) comprises:
 - (1) calculating a perturbation of the selected signal resulting from generating the stimulation pulse through the first electrode.
25. The method of claim 18, wherein (i) comprises:
 - (1) determining whether the selected signal is characterized by excessive flat-lining.

26. The method of claim 18, wherein (i) comprises:
(1) measuring an impedance associated with the selected electrode.
27. The method of claim 18, wherein (i) comprises:
(1) determining if a selected amplifier is saturated, the selected amplifier being associated with the selected signal.
28. The method of claim 23, wherein the geometric configuration is represented by corresponding distances between each pair of electrodes.
29. The method of claim 13, further comprising:
(f) in response to (b), detecting a continuation of a seizure of the nervous system disorder;
(g) determining a time difference between a current time and an occurrence of the stimulation pulse; and
(h) if the time difference is not less than a first predetermined time, generating a next stimulation pulse through the first electrode.
30. The method of claim 13, further comprising:
(f) if a cluster timer has not expired, repeating (b); and
(g) if the cluster timer has expired and the state of seizure is not occurring, concluding that a detection cluster has terminated.
31. The method of claim 30, further comprising:
(h) in response to (g), storing data that is representative of the first signal and the selected signal during the detection cluster.
32. The method of claim 30, further comprising:
(h) repeating (a)-(g).

33. The method of claim 12, wherein the nervous system disorder is selected from the group consisting of a disorder of a central nervous system, a disorder of a peripheral nervous system, a mental health disorder, and a psychiatric disorder.

34. The method of claim 33, wherein the nervous system disorder is selected from the group consisting of epilepsy, Parkinson's disease, essential tremor, dystonia, multiple sclerosis (MS), anxiety, a mood disorder, a sleep disorder, obesity, and anorexia.

35. The method of claim 12, wherein the treatment therapy is selected from the group consisting of electrical stimulation, magnetic stimulation, drug infusion, and brain temperature control.

36. The method of claim 13, further comprising:
(f) receiving another signal from another electrode;
(g) determining that an artifact is induced on the other signal;
(h) in response to (g), blanking the other signal for another blanking time interval.

37. The method of claim 12, wherein the treatment therapy is provided to a location of a body selected from the group consisting of a brain, a vagal nerve, a spinal cord, and a peripheral nerve.

38. A computer-readable medium having computer-executable instructions for performing the method recited in claim 12.

39. A computer-readable medium having computer-executable instructions for performing the method recited in claim 13.

40. A computer-readable medium having computer-executable instructions for performing the method recited in claim 29.

41. A computer-readable medium having computer-executable instructions for performing the method recited in claim 30.

42. A computer-readable medium having computer-executable instructions for performing the method recited in claim 31.

43. A computer-readable medium having computer-executable instructions for performing the method recited in claim 36.

44. A method for providing treatment therapy for a nervous system disorder, comprising:

(a) receiving a first signal from a first electrode and a selected signal from a selected electrode;

(b) analyzing the first signal and the selected signal;

(c) in response to (b), generating a stimulation pulse through the first electrode during a stimulation time interval;

(d) blanking the first signal during the stimulation time interval;

(e) determining that an artifact is induced on the selected signal by the stimulation pulse; and

(f) in response to (e), blanking the selected signal for a blanking time interval.